Bellwork: 4/8/13

Solve the following rational equation:

1) $\frac{3}{x^2+4x} + \frac{2}{x^2+2x-8} = \frac{4}{x^2-2x}$

LCD: $x(x+4)(x-2)$

Restrictions:

$x=0$ | $x+4=0$ | $x-2=0$

$x\neq 0$ | $x\neq -4$ | $x\neq 2$

$x(x+4) \quad (x+4)(x-2) \quad x(x-2)$

$$\frac{3(x-2)}{x(x+4)(x-2)} + \frac{2x}{x(x+4)(x-2)} = \frac{4(x+4)}{x(x+4)(x-2)}$$

$3x-6+2x=4x+16$

$5x-6=4x+16$

$x-6=16$

$x=22$

3) $\frac{x}{x-5} + \frac{x}{x-5} = \frac{3}{1}$

LCD: $(x-5)$

$$\frac{x}{x-5} + \frac{x}{x-5} = \frac{3(x-5)}{(x-5)}$$

$x+x=3(x-5)$

$2x=3x-15$

$-3x \quad -3x$

$-x=-15$

$x-5=0$

$x\neq 5$

$x=15$

7) $\frac{5}{x-3} = \frac{2x}{x^2-9}$

$(x-3) \mid (x+3)(x-3)$

LCD: $(x-3)(x+3)$

$x-3=0 \quad x+3=0$

$\frac{5(x+3)}{(x-3)(x+3)} = \frac{2x}{(x+3)(x-3)}$

$5(x+3) = 2x$

$5x+15 = 2x$

$-5x \quad -5x$

$15 = -3x$

$-3 \quad -3$

$x = -5$

$x \neq 3, -3$

8) $\frac{1}{9} + \frac{1}{2x} = \frac{1}{x^2}$

$9 \mid 2 \cdot x \mid x \cdot x$

LCD: $9 \cdot 2 \cdot x \cdot x$

$x = 0$

$\frac{1 \cdot 2 \cdot x \cdot x}{9 \cdot 2 \cdot x \cdot x} + \frac{1 \cdot 9x}{2x \cdot 9x} = \frac{1 \cdot 2 \cdot 9}{x \cdot x \cdot 2 \cdot 9}$

$2x^2 + 9x = 18$

-18

$2x^2 + 9x - 18 = 0$ -36

$(2x^2 + 12x - 3x - 18) = 0$

$2x(x+6) - 3(x+6) = 0$

$(2x-3)(x+6) = 0$

$2x-3=0 \quad x+6=0$

$2x=3$

$x = \frac{3}{2} \quad x = -6$

$x \neq 0$

11) $\frac{6x}{x-7} = \frac{x-49}{x^2-7x} + \frac{1(x-7)}{x}$

$x(x-7)$ | $x(x-7)$ | $x(x-7)$

LCD: $x(x-7)$

$x=0 \quad x-7=0$

$6x = x-49+x-7$

$6x = 2x-56$

$-2x \quad -2x$

$4x = -56$

$x = -14$

$x \neq 0, 7$

12) $\frac{x(x-4)}{2x-6} = \frac{2\cdot 2(x-3)}{x-4}$

$2(x-3)$ | $(x-4)$

LCD: $2(x-3)(x-4)$

$x-3=0 \quad x-4=0$

$x(x-4) = 4(x-3)$

$x^2-4x = 4x-12$

$-4x+12 \quad -4x+12$

$x^2-8x+12=0$

$(x-6)(x-2)$

$x-6=0 \quad x-2=0$

$x=6 \quad x=2$

$x \neq 3, 4$

$x = 6, 2$

Homework: 4/8/13

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